State Highway and WSF Systems Preservation

Paula J. Hammond, P.E.
Secretary

David L. Dye, P.E.
Deputy Secretary

Steve Reinmuth
Chief of Staff

Jay Alexander
Capital Program Development & Management Director

Tom Baker, P.E.
State Materials Engineer

Ray Deardorf
WSF Planning Director

Washington State Transportation Commission
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Washington State Department of Transportation

Pavement Preservation

Pavement Type	Lane Miles	% of Lane Miles	Traffic volume (billions)	% of total traffic volume
Concrete	2,422	13%	8.6	27.9%
Chip seal	4,425	24%	1.2	3.8%
Asphalt	11,638	63%	20.9	68.3%
Total	18,500	100%	30.7	100%

- **Priority:** Lowest Life Cycle Cost
- **Analysis:** Cost evaluated on an annual/biennial basis
  - Order of Implementing at Lowest Life Cycle: Chip seal, asphalt (due), asphalt (past due), concrete

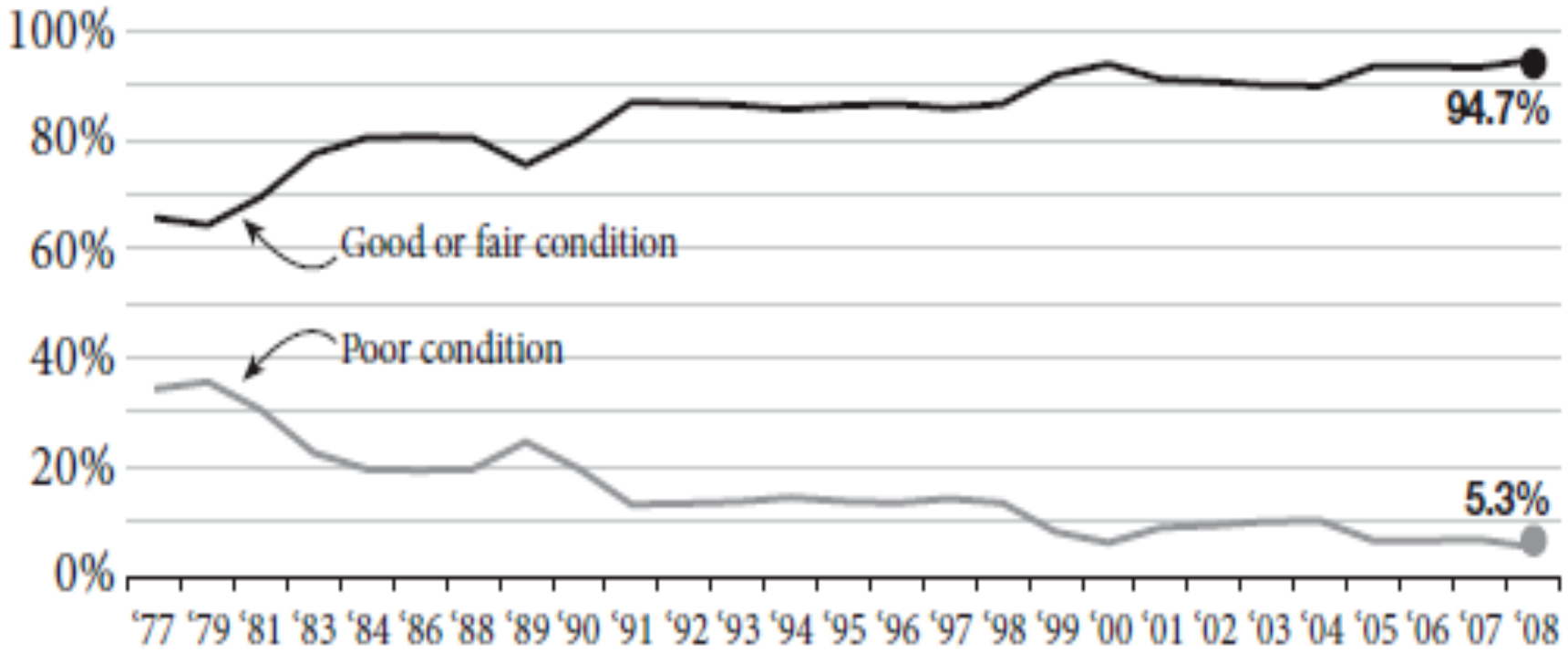
Pavement Preservation:
Condition & Funding

Pavement Type	2007 Condition Rating	2008 Condition Rating
Concrete	Good/Fair – 93% Poor – 7%	Good/Fair – 92% Poor – 8%
Chip seal	Good/Fair – 92% Poor – 8%	Good/Fair – 97% Poor – 3%
Asphalt	Good/Fair – 94% Poor – 6%	Good/Fair – 94% Poor – 6%
Total	Good/Fair – 93.3% Poor – 6.7%	Good/Fair – 94.7% Poor – 5.3%

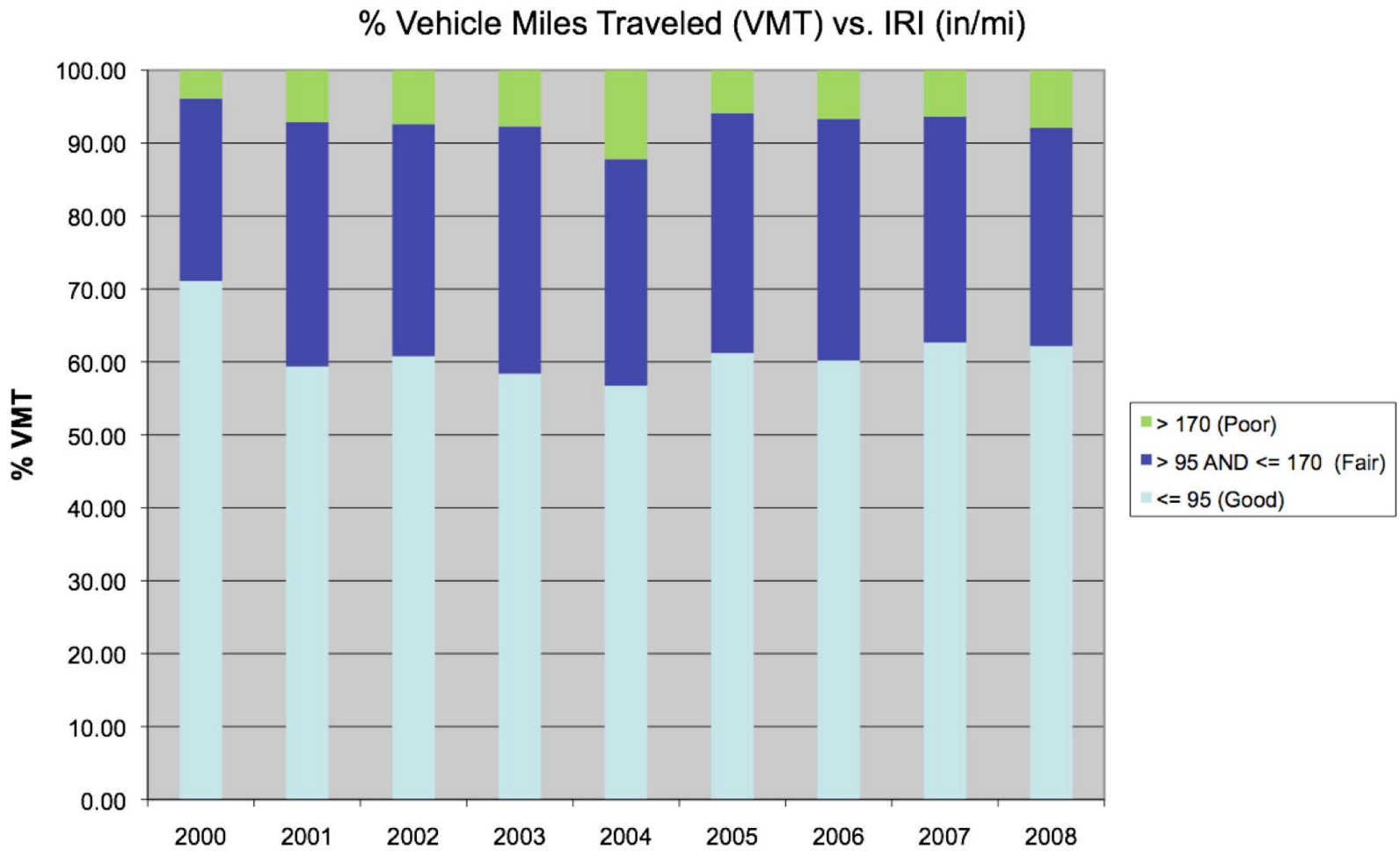
- **16 Year Funding Available:** $2.1 billion
- **Unfunded Need:** $1.5-2.0 billion *(estimated)*
- **Emerging Issue**: Concrete Life

Pavement Condition Trends, 1977-2008

All pavement types



Pavement Condition Based on VMT

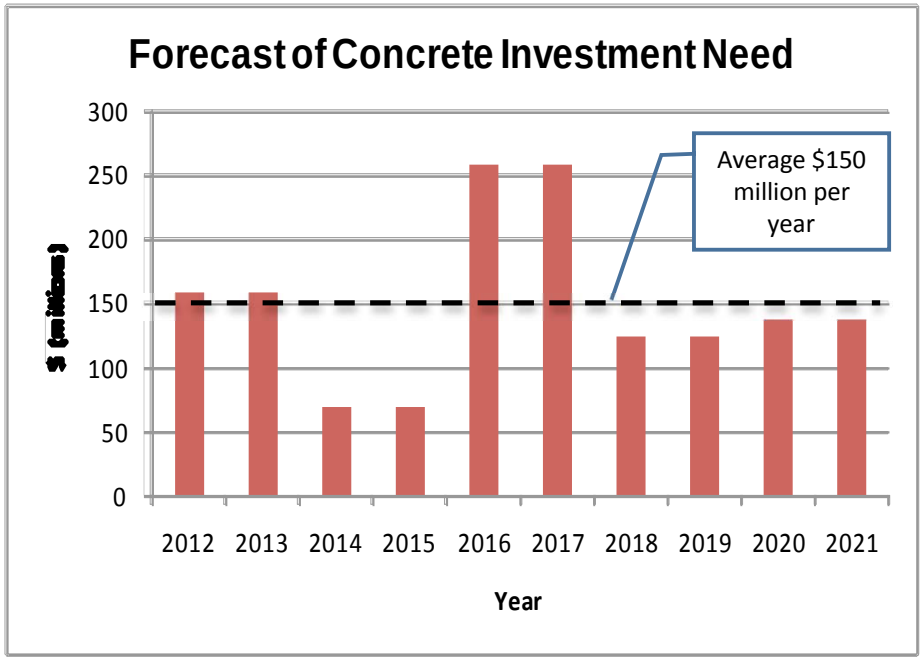


Pavement Strategies:
Effects of Implementing New Technology

- New technology extends pavement life, reducing life cycle costs. These include:
  - Reducing pavement structure through better design methodology
  - Reusing Asphalt Pavement
  - Implementing Superpave and Performance Graded Binders
  - Improved Hot Mix Asphalt (HMA) paving practices
  - Eliminating thermal differentials and density differentials
  - Better longitudinal joints
  - Dowel-Bar Retrofit (DBR) for concrete pavements
  - Better concrete panel replacement methods

Pavement Strategies:
Extending Life and Reducing Costs

- Preventive maintenance
  - Addressing early distress
  - Correcting short sections
  - Crack sealing/patching
- Extending asphalt pavement life with use of BSTs ("Chip Seals")
- Three key strategies to extend concrete pavement life:
  - Dowel Bar Retrofit
  - Diamond grinding with select panel replacement
  - Reconstruction



Bridge Preservation

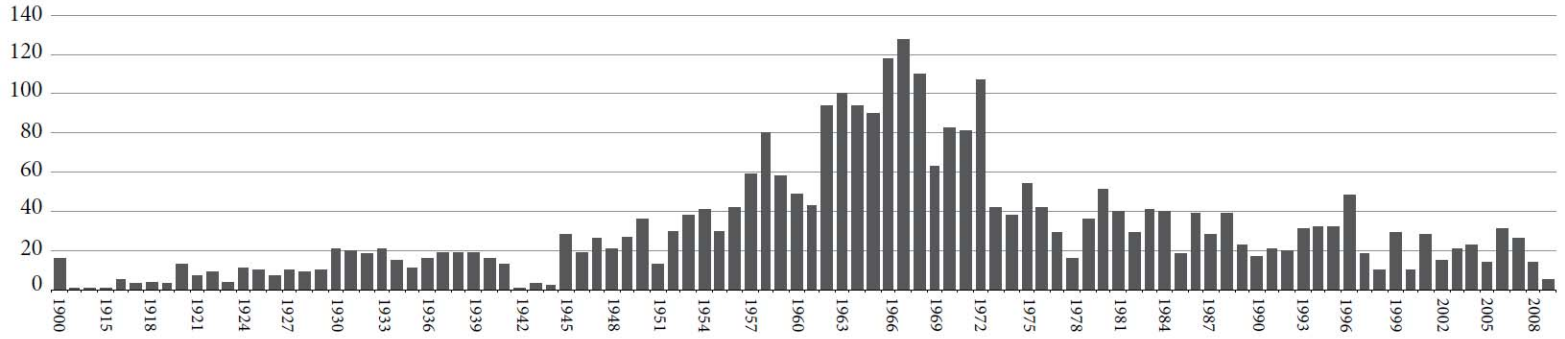
Structure	Count
Vehicular > 20 feet	3,023
Structures < 20 feet	336
Border Bridges	6
Culverts > 20 feet	90
Pedestrian	65
Tunnels and Lids	39
Ferry Terminal Structures	71
Buildings	1
Railroad	5
Total	3,630

- **Priority**: Asset Condition
- **Analysis**: Identify deficiencies based on analysis of current and projected deterioration
  - Order of Implementing:
    - Repair
    - Prevention Strategies: Bridge deck protective overlays, Painting, Scour Prevention, Seismic Retrofit
    - Rehabilitation & Replacement

Bridge Preservation:
Structural Condition & Funding

Category	Description	2009 Condition Rating
Good	No problems to some minor deterioration	89%
Fair	All primary elements are sound, but may have minor deficiencies	8%
Poor	Advanced deficiencies of primary structural components; may have truck weight restrictions	3%

Number of bridges by year built



Data Source: WSDOT Bridge Office (November 2009).

- **16 Year Funding Available:** $1.5 billion
- **Unfunded Need:** more than $0.5 billion near term (*estimate being refined)*

Highway Facilities & Other Features

- **Unstable Slopes**: Address the highest risk locations based on 2006 report.
- **Major Drainage**: Inventory of locations and condition assessment currently underway.
- **Major Electrical**: Address the highest priorities based on the 2008 inventory.
- **Weigh Stations**: Evaluate new strategies to meet regulatory requirements without investing in new facilities.
- **Rest Areas**: Continue lowest life cycle cost preservation of structures and pavements.

- **16 Year Funding Available:** $600 million
- **Unfunded Need:** *potential future unfunded needs are being evaluated*

WSF Preservation:
Setting the Context

- Component of the Capital portion of the Ferries Long-Range Plan

- Terminal improvement, vessel improvement, and vessel acquisition project funding requests must adhere to the capital plan. (RCW 47.60.385 as amended by Sec. 6, ESHB 3209, Laws of 2010).

- The capital plan must adhere to the following:
  - A current ridership demand forecast;
  - Vehicle level of service standards as described in RCW 47.06.140;
  - Operational strategies as described in RCW 47.60.327; and
  - Terminal and vessel design standards as described in RCW 47.60.365. (RCW 47.60.375(1) as amended by Sec. 5, ESHB 3209, Laws of 2010).

Legislative Direction on Long Range Plan

Essential vs. Non Essential Capital

The Legislature made a fundamental distinction between essential and non-essential capital when reviewing future Ferry System needs

•The types of investments that were deemed to be essential include:

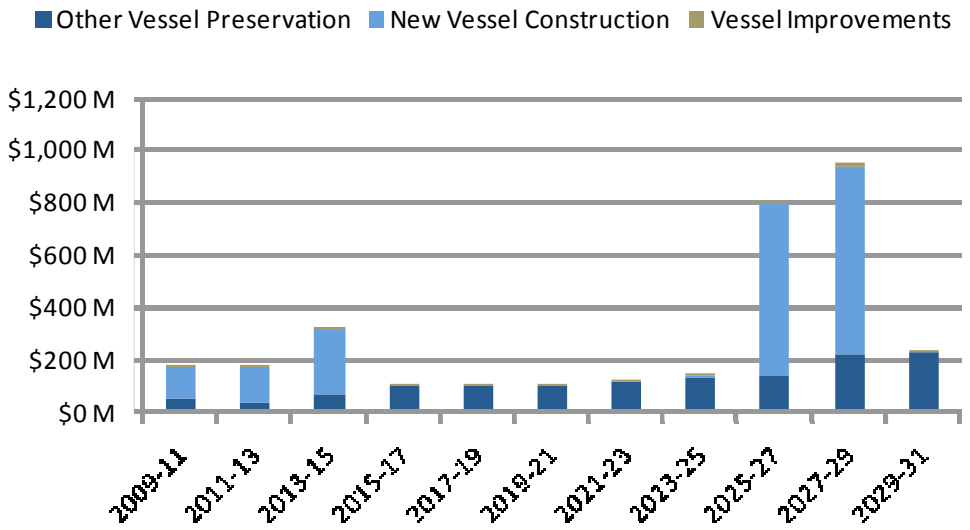
- Vessel and terminal preservation.
- Vessel replacement for vessels that are due to be retired.
- Improvements for vessels and terminals for emergency repairs and to comply with regulatory requirements (Coast Guard, seismic, etc…) .
- Some modest vessel and terminal improvements, where these improvements adhere to the ridership demand forecast, vehicle level of service standards, operational strategies and terminal design standards and can be demonstrated to add significant value.

•Other LRP needs were determined to be non-essential and would only be considered if conditions changed or additional “outside” funding were to come available (e.g. terminal dwell time improvements and transit enhancements).

Vessel Preservation, Acquisitions & Improvements

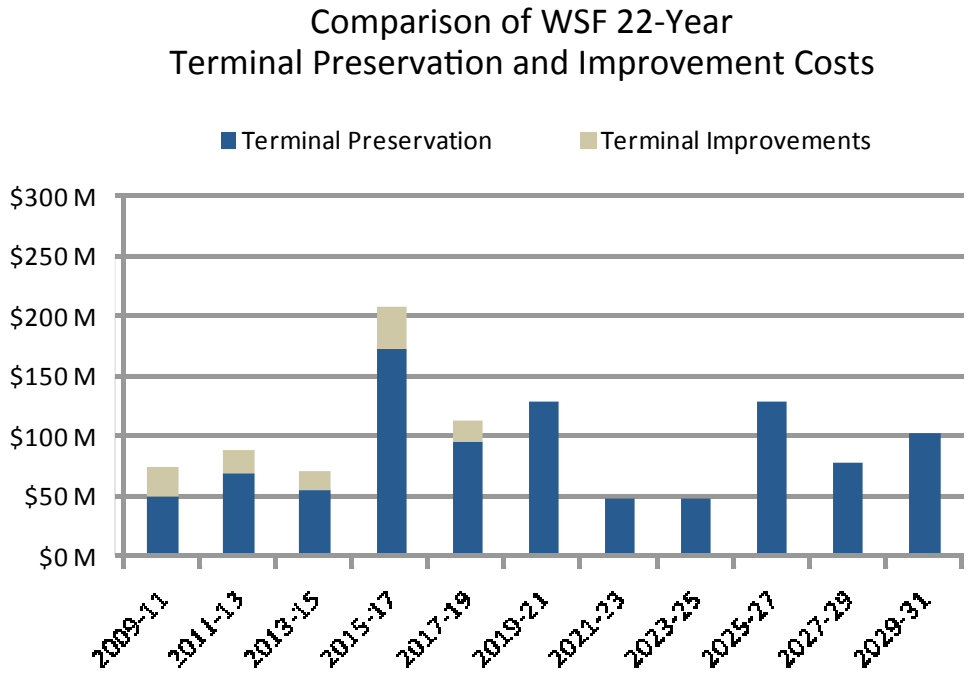
- Vessel preservation and emergency repairs total about $1.3 billion over 22 years.
  - Preservation needs are developed for all vessels in the fleet
  - Preservation expenditures extend the useful life of existing vessels (e.g. MV Hyak).
- Vessel acquisitions total $1.9 billion over 22 years.
  - Acquisitions include three 64-car vessels ($184.2 million) and seven new 144-car vessels ($1.7 billion).
  - Many large vessel acquisitions are deferred beyond the 16-Year Plan (2009-2025).
- Vessel Improvements total $84 million over 22 years. Examples include: fuel conservation; regulatory compliance; and other targeted improvements.
- Vessel acquisitions and improvements must adhere to the ridership demand forecast, vehicle level of service standards, operational strategies and terminal and vessel design standards.

Comparison of WSF 22-Year
Vessel Preservation and Improvement Costs



Terminal Preservation & Improvements

- Terminal preservation needs are estimated to be about $985.1 million over 22 years.
- Legislative direction for the 16-Year Plan is to reduce work on non-vital systems to get closer to WSF's asset maintenance performance goals.
- Terminal improvements total $110.8 million and include projects that:
  - — Adhere to the ridership demand forecast, vehicle level of service standards, operational strategies and terminal design standards
  - — Can be demonstrated to add significant value; and
  - — Funded through existing resources.
- Improvements include major terminal projects, reservation system, and other modest investments.



Legislative Direction
New Vessels

The Legislature made a commitment to replace vessels when they are due to be retired:

- In the next 16-years there will be 5 new vessels constructed (three 64-car vessels and two 144-car vessels)
- If funding falls short, the 4th vessel could be a 64-car vessel instead of a 144-car vessel
- Another 5 new vessels will need to be retired in the last 6 years of the Long-Range Plan

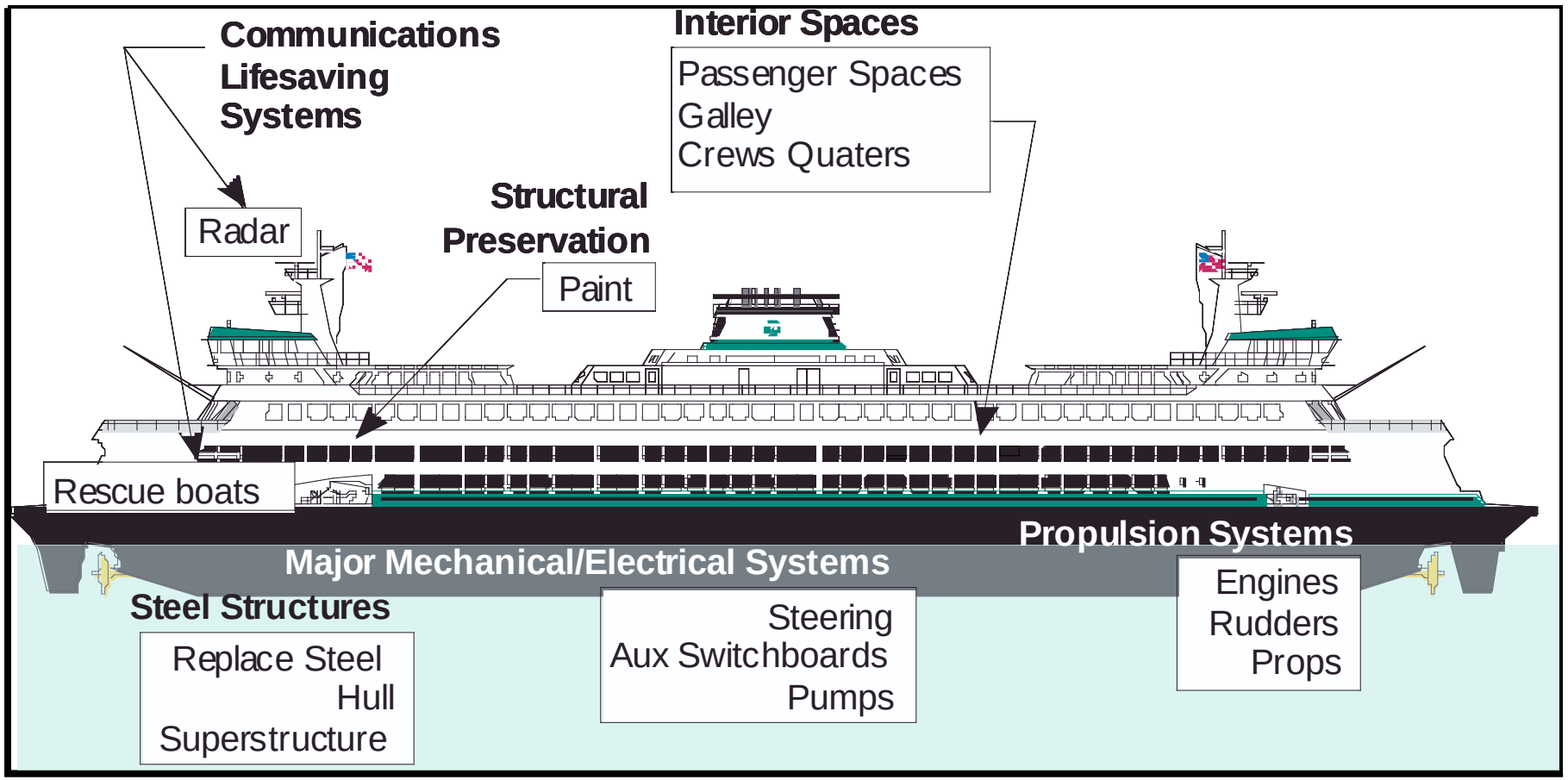
Year	Vessel	Notes
2010	Island Home #1	Replace a Steel Electric (Port Townsend)
2011	Island Home #2	Replace a Steel Electric (Port Townsend)
2011	Hyak reinvestment	Invest in the Hyak to extend life 20 years
2012	Island Home #3	Replace the Rhododendron (go to Point Defian
Procurement #1 (144's)		
2014	144-car vessel #1	Replace the Evergreen State
2014	144-car vessel #2	Restore standby/reserve capacity; 87-car vess to standby
Procurement #2 (144's)		
2029	144-car vessel #3	Replace the Tillikum
2030	144-car vessel #4	Replace the Klahowya
2030	144-car vessel #5	Replace the Elwha
2031	144-car vessel #6	Replace the Kaleetan
2031	144-car vessel #7	Replace the Yakima

Ferries Two and Six-Year Construction Program Funding Profile

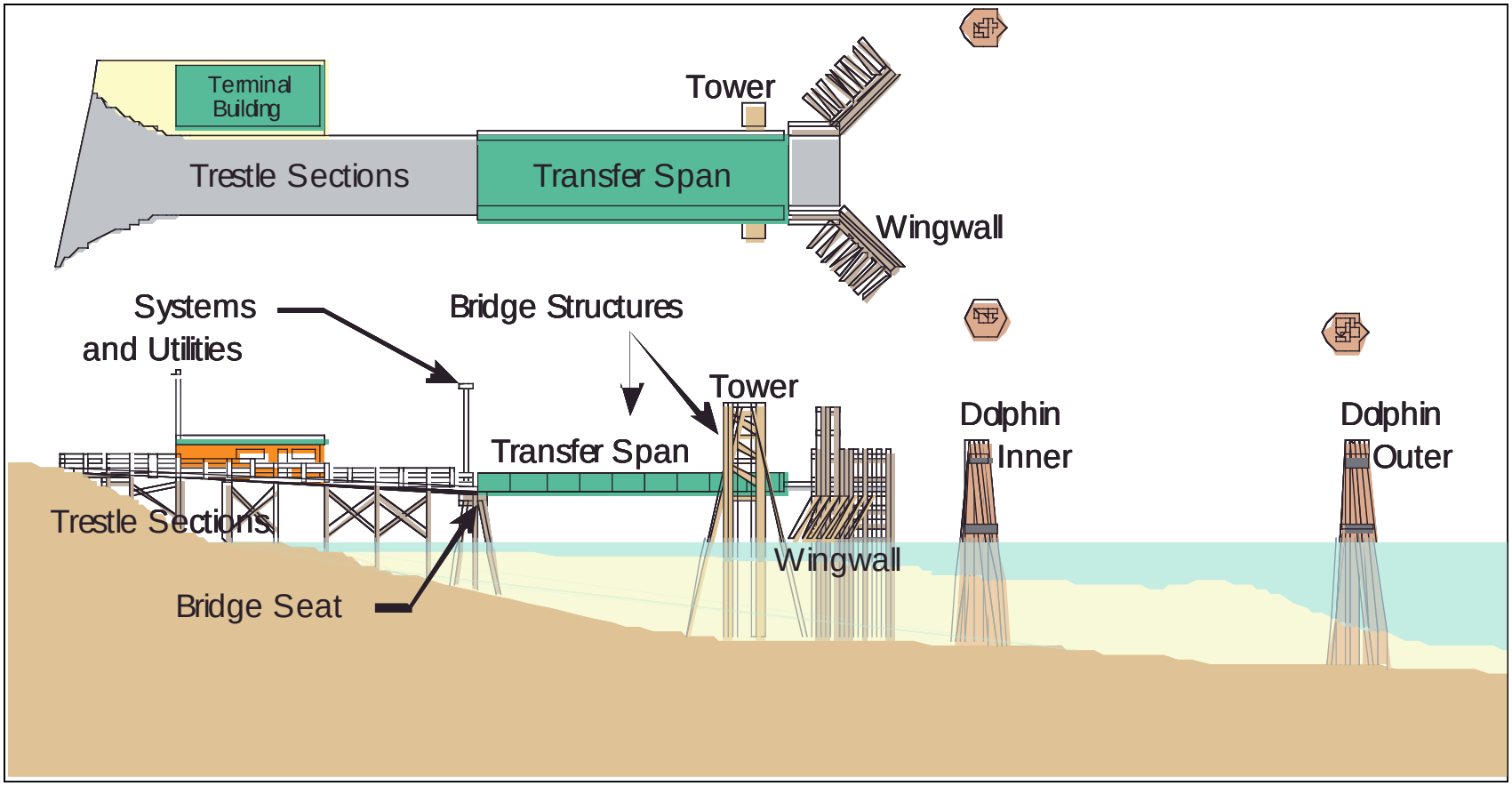
Ferries Construction Program
Terminal, Vessel and Emergency Repairs Sub-programs
(Dollars in millions)

Sub-programs	09-11 Budget	% of Total	6-Year Plan	% of Total
Terminal Construction Subprogram	86.4	30%	265.1	27%
Vessel Construction Subprogram	192.0	67%	716.3	72%
Emergency Repairs Subprogram	6.3	2%	15.8	2%
Total Ferries Construction Program	284.7	100%	997.1	100%

Vessel Preservation Components



Terminal Preservation Components



Ferries Capital Preservation Funding by Types of Terminal and Vessel Systems – Current Biennium Detail

- Over half of 09-11 terminal preservation funding is for buildings and dolphins.
- Almost 3/4 of 09-11 vessel preservation funding is for replacement of propulsion systems, passenger and crew space renovation, and rehabilitation of structural preservation (paint) systems.

Ferries Construction Program
Terminal Preservation by Type of System
(Dollars in millions)

Preservation by Type of System	09-11 Budget	% of Total	6-Year Plan	% of Total
Terminal Building	15.7	27%	21.0	11%
Dolphin	15.1	26%	34.7	17%
Admin and Project S	8.1	14%	22.9	12%
Bridge	7.3	12%	33.0	17%
Trestle	6.9	12%	43.2	22%
Wingwall	4.1	7%	14.2	7%
OHL	1.4	2%	24.9	13%
Paved Area	0.1	0%	3.5	2%
Security	0.0	0%	1.2	1%
POF	0.0	0%	0.0	0%
Other	0.2	0%	0.2	0%
Total	58.9	100%	198.8	100%

Ferries Construction Program
Vessel Preservation by Type of System
(Dollars in millions)

Vessel Preservation By Type of System	09-11 Budget	% of Total	6-Year Plan	% of Total
Propulsion Systems	13.7	26%	33.3	21%
Passenger and Crew Spaces	12.6	24%	19.4	12%
Structural Preservation (Paint)	11.4	21%	45.6	28%
Major Mechanical/Electrical Systems	3.8	7%	8.9	6%
Admin and Project Support	3.4	6%	8.2	5%
Comm/Nav/Lifesaving Equipment	3.3	6%	12.3	8%
Steel Replacement	3.0	6%	15.7	10%
Piping Replacement	2.4	4%	11.5	7%
Other	0.0	0%	3.6	2%
Security	0.0	0%	1.6	1%
Total	53.6	100%	160.1	100%

Projected Performance-based Budget Results From the Six-Year Capital Investment Plan

How does OFM measure WSF's success in having safe and sound infrastructure? The performance of preservation and acquisition investments is measured in terms of the preservation needs percent (PNP). This measure consists of the percent of the value of systems comprising terminals or vessels that are operating beyond their standard life cycles. There are two categories of systems - each having a performance objective based on the PNP measure:
Category 1 (vital) systems meet their performance objective when their PNP is 10% or less.
Category 2 (other) systems meet their performance objective when their PNP is between 20% and 40%.

Performance-Based Budget Results
Measured in Terms of OFM's Preservation Needs Percent (PNP)

Terminal Construction Sub-program

	07-09	09-11	11-13	13-15
Cat 1 (Vital) Systems	5%	5%	13%	16%
Cat 2 (Other) Systems	13%	13%	14%	22%

Vessel Construction Sub-program

	07-09	09-11	11-13	13-15
Cat 1 (Vital) Systems	13%	8%	10%	4%
Cat 2 (Other) Systems	43%	37%	33%	25%

Legend:
- Over performance objective
- Meets performance objective
- Under performance objective

Terminal performance

- At the start of the 09-11 biennium, terminals have a cat 1 PNP of 5% (meets performance objective) and a cat 2 PNP of 13% (over performance objective).
- At the end of six years, terminals will have a cat 1 PNP of 16% (under performance objective) and a cat 2 PNP of 22% (meets performance objective). The terminal cat 1 performance is under the objective due to the impact of the freeze on investments in the 2007-2009 Biennium.

Vessel performance

- At the start of the 09-11 biennium, the fleet has a cat 1 PNP of 13% (under performance objective) and a cat 2 PNP of 43% (under performance objective).
- At the end of six years, the fleet will have a cat 1 PNP of 4% (meets performance objective) and a cat 2 PNP of 25% (meets performance objective).

Questions?

For more information please contact:

Jay Alexander, Capital Program Development & Management Director, at (360) 705-7121, or Alexanja@wsdot.wa.gov

Tom Baker, State Materials Engineer, at (360) 709-5401, or BakerT@wsdot.wa.gov

Ray Deardorf, WSF Planning Director, at (206) 515-3491 or Deardorf@wsdot.wa.gov

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